Former NAS Brunswick

Restoration Advisory Board Meeting

20 November 2019

The Brunswick Hotel
4 Noble Street
Brunswick, Maine
4:30 PM

Introductions

- **RAB Co-Chairs:**
  - Ms. Suzanne L. Johnson, Esq.
  - Mr. Paul Burgio, BRAC Environmental Coordinator, Navy BRAC Program Management Office
- **RAB Members:**
  - Mr. Todd Bober, P.E., Remedial Project Manager, Navy
  - Mr. Michael Daly, Remedial Project Manager, United States Environmental Protection Agency (EPA)
  - Mr. Iver McLeod, Remedial Project Manager, Maine Department of Environmental Protection (MEDEP)

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Introductions

- **RAB Members (continued):**
  - Mr. Steve Levesque, Midcoast Regional Redevelopment Authority (MRRA)
  - Mr. Paul Ciesielski, Town of Harpswell, Maine
  - Mr. Scott Libby, Town of Topsham, Maine
  - Ms. Carol A. White, C.A. White & Associates, Brunswick Area Citizens for a Safe Environment (BACSE)
  - Mr. David Page, PhD, Town of Brunswick, Maine
- **Other RAB Attendees:**
  - Mr. Finn Whiting, MEDEP
  - Mr. Dave Barney, Navy

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Meeting Agenda

Welcome

Introductions

- New BEC Introduction and Nomination for RAB Navy Co-Chair

2019 In Review

- Quarry Soil Cover Installation Completion
- GWETS PFAS Monitoring
- PFAS Management Support
  - PFAS Sampling on Former/Current Navy Property
  - Supplemental PFAS Treatment System Construction
- Basewide PFAS Investigation
- Picnic Pond System FS and Proposed Plan

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Meeting Agenda (cont'd)

2019 in Review (continued)

- Site 9 OPS Demonstration/FOST
- Site 4 ESD
- Quarry and Site 2 RACRs

Upcoming Work - 2020

- Airfield Stormwater Drainage System PFAS Study
- Quarry Groundwater Monitoring
- Five Year Review
- Extraction Well Evaluation – Eastern Plume
- Recurring Activities (LTM, GWETS PFAS Sampling, Annual LUC Inspections)

Questions/Wrap-Up

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2019 in Review

Quarry Soil Cover Completion Construction Tasks – Fall 2018

- **Removed aboveground debris**
- **Cleared munitions of concern if present**
  - Berm area
  - Rock wall
  - Perimeter fence area
- **Installed 1-foot-thick (minimum) protective soil cap including:**
  - Re-use of berm area soil
  - Sub-base drainage layer
  - Demarcation geotextile
  - Common fill and topsoil

2019 in Review

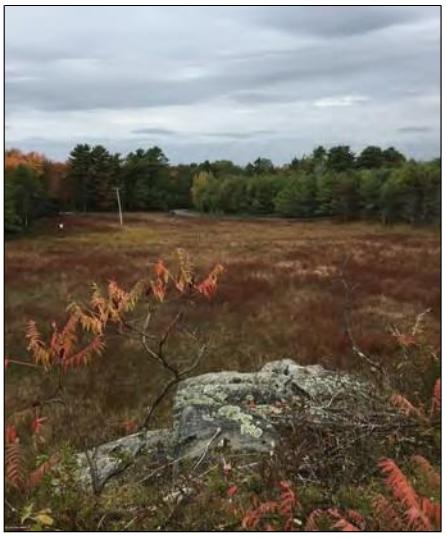
Quarry Soil Cover Completion Restoration Tasks – 2019

- Installed monitoring wells
- Seeded protective cap and disturbed areas
- Installed LUC signs
- Installed kiosk with UXO safety sheets

2019 in Review

Quarry Soil Cover Completion Tasks

- Submitted Completion Report in October 2019
- Inspections in June and October 2019
- Long-term monitoring to be conducted
- LUCs implemented for protection of the public and environment



2019 in Review

GWETS PFAS Monitoring/Carbon Replacement

GWETS Operational History:

- **June 1995–began operating to cleanup volatile organic compounds (VOCs)**
- **March 2010–began additional treatment for 1,4-dioxane**
- **November 2015–began additional treatment for PFAS**

Basic Plant Design:

- **Pump groundwater from extraction wells in Eastern Plume**
- **Groundwater goes through various treatment systems**
  - HiPOx system to treat 1,4-dioxane
  - Granular activated carbon (GAC) to treat VOCs and PFAS
- **Formerly had air stripping unit to treat VOCs; currently bypassed**

2019 in Review

GWETS PFAS Monitoring/ Carbon Replacement (continued)

Current PFAS Monitoring Program:

- **Monthly sampling began December 2015**
  - Samples collected from plant influent, GAC midpoint, and plant effluent
- **Latest GAC replacement in both vessels December 2018**

2019 in Review

GWETS PFAS Monitoring/ Carbon Replacement (continued)

- **Influent concentrations of PFOA and PFOS remain steady, > EPA Health Advisories (HAs) of 70 ng/L each and 70 ng/L combined PFOA/PFOS**
  - September 2019 PFOA influent 1,400 ng/L
  - September 2019 PFOS influent 300 ng/L
- **September 2019 PFOA/PFOS levels at GAC mid-point <20 ng/L**
- **September 2019 PFOA/PFOS levels in plant effluent <2 ng/L (non-detect)**

2019 in Review

PFAS Sampling on Former/ Current Navy Property

- **Navy performed due-diligence PFAS groundwater investigations to support property redevelopment activities where construction-related groundwater management is a possibility**
- **Results are compared to USEPA Lifetime HAs of 70 ng/L each for PFOA and PFOS, 70 ng/L for combined PFOA and PFOS, and the MEDEP RAG for perfluorobutane sulfonic acid (PFBS) of 400,000 ng/L.**

Investigations were performed at:

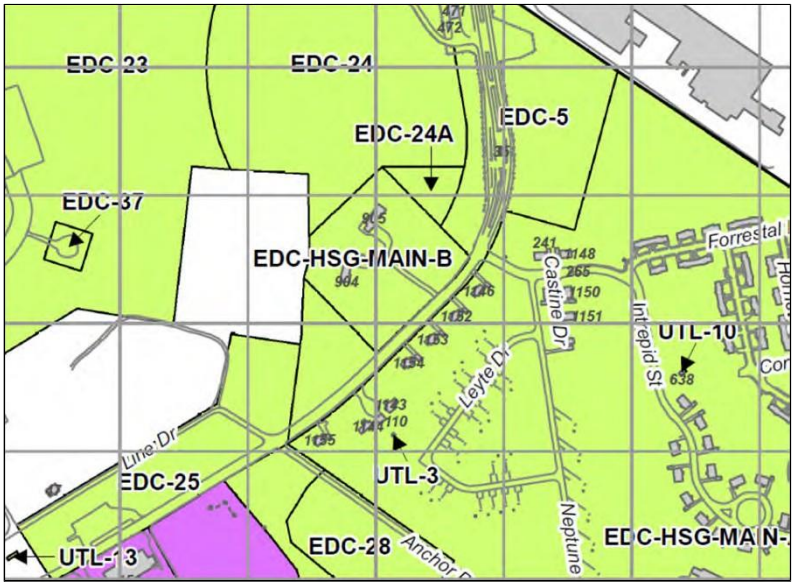
Captains Way	Site 9
Wild Oats	Blue Dog Day Care
Undocumented Orion Street Landfill	

2019 in Review

Captains Way PFAS Sampling

- Former Buildings 904 and 905, considered for redevelopment as multi-unit housing area
- Located in northeastern corner of former base between Site 7 and southern end of former Fitch Avenue Skeet Range
- Installed five shallow monitoring wells
- All PFOA and PFOS detections were < 2 ng/L

Captains Way Location

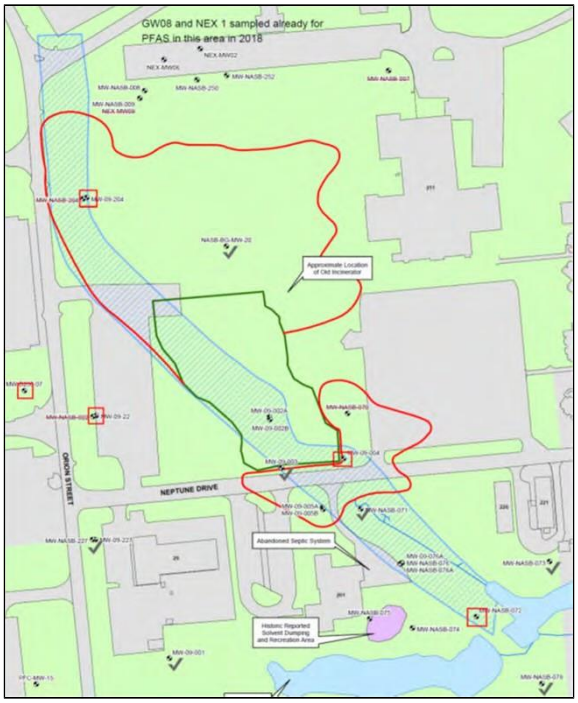


2019 in Review

Site 9 PFAS Sampling

- **Neptune Drive Disposal Site–Former incinerator and ash landfill/dump area located east of/across Orion Street from central portion of the airfield**
- **Investigated to support property transfer for town-planned redevelopment (recreational) north of Neptune Drive**
- **Sampled five wells to build on earlier PFAS sampling in the area**
  - One of five wells (located adjacent to the impoundment ponds) had combined PFOA/PFOS slightly above the LHA
  - Prior sampling results include PFAS exceedances in wells south of Neptune Drive, not in central Site 9 area

Site 9 Wells Sampled for PFAS



2019 in Review

Wild Oats Restaurant PFAS Sampling

- **Planned restaurant located along Fitch Avenue in central area of the former base**
- **Investigated to support planned building construction activities**
- **Installed and sampled three shallow wells for PFAS**
  - All results were well below the LHA (maximum 29 ng/L combined PFOA/PFOS)
  - Nearby Building 223 and Lot 15 parcels were investigated previously for PFAS with no issues identified

Wild Oats Property, Well Locations

2019 in Review

Blue Dog Day Care PFAS Sampling

- **Planned dog day care facility located in the north-central area of the former base**
- **Investigated to support planned building construction activities**
- **Installed and sampled three shallow wells for PFAS**
  - Two of three results were well below the LHA (maximum 29 ng/L combined PFOA/PFOS)
  - One well slightly exceeded the LHA for PFOA (71.45 ng/L) and combined PFOA/PFOS (83.28 ng/L) but is north of the planned construction area
  - Building 653 (PFAS-impacted) is approximately 500 feet south-southwest of the Blue Dog location

Blue Dog Property, Well Locations

2019 in Review

Orion Street Landfill PFAS Sampling

- **Open area located in the central area of the former base near the GWETS**
- **FOST completed to transfer from Navy ownership (economic development) in late 2018**
- **Installed and sampled four shallow wells and one deep well for PFAS and VOCs**
  - Three of five results were well below the LHA (maximum 29 ng/L combined PFOA/PFOS)
  - One well (4S) exceeded the LHA for PFOA (93.09 ng/L), and one well (03) exceeded the LHA for PFOS (189.06 ng/L)
  - There were no exceedances of MCLs/RAGs for VOCs

Undocumented Orion Street Landfill, Well Locations

2019 in Review

PFAS Construction Dewatering Water Treatment System (CDWTS)

The CDWTS was designed and installed by the Navy to facilitate redevelopment of former Navy properties with PFAS contamination by treating PFAS from construction water generated during redevelopment and construction activities.

Influent Tank Outside Treatment Building

2019 in Review

PFAS CDWTS (continued)

System Equipment

- Influent Tank
- Transfer Pump
- Two Bag Filters
  - 25 to 10-micron bag
- Two GAC Filters
  - 1,000 pounds each
  - Up to 25-gpm flow rate

Discharge Options

- Infiltration gallery to groundwater
- Existing GWETS influent tank for secondary treatment

Bag Filters

GAC Filters

2019 in Review

PFAS CDWTS (continued)

Completion Tasks

- **System was operational in summer 2019**
- **To be drained and protected during winter months**
- **Preparation of Operation and Maintenance (O&M) Manual**

Accomplishments

- **Proactive support for property redevelopment by providing means to remove PFAS in construction water**
- **Fast-tracked–design to start-up in less than 6 months**
- **Continued Navy O&M of system to facilitate future property development**

2019 in Review

Basewide PFAS Investigation

Current PFAS Programs:

- **Construction Dewatering PFAS Treatment**—Treatment of PFAS in groundwater pumped from construction areas associated with future redevelopment activities
- **Stormwater Drainage System**—Evaluates PFAS concentrations in stormwater associated with basewide stormwater drainage system
- **GWETS PFAS Treatment Pilot Study**—Treatment of PFAS in groundwater associated with Eastern Plume via existing treatment plant
- **Off-Base Investigation**—Evaluates/monitors PFAS in private wells and/or other environmental media in off-base areas
- **Basewide Program**—Evaluates/monitors PFAS in various environmental media within the former base boundary

2019 in Review

Basewide PFAS Investigation (cont'd)

PFAS Investigation Summary Report

- Comprehensive summary of investigations between October 2010 and April 2019
- Reporting Areas created due to significant amount of data and physical extent of investigation areas
  - Primarily based on natural features
  - May change over time based on new data and/or information
- Human health risk evaluation conducted
- Draft submitted August 6, 2019

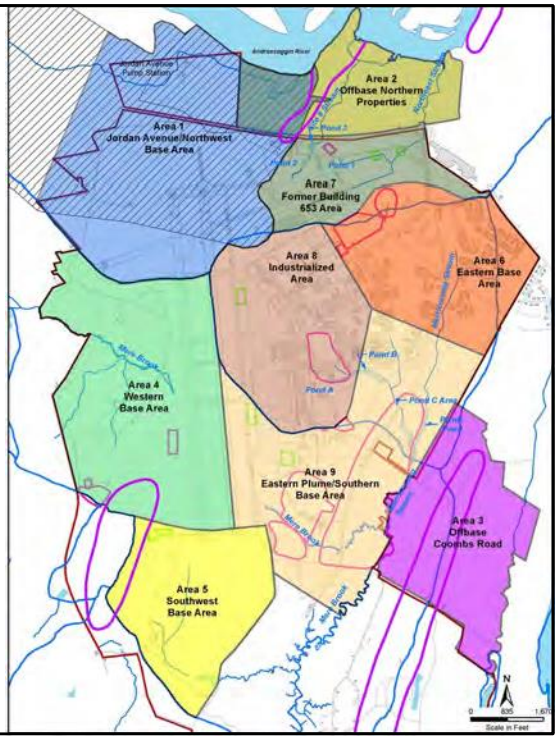
Number of PFAS Samples Collected to Date

Groundwater	*256*
GWETS	*147*
Surface Water	*50*
Sediment	*47*
Water Supply or Private Well (Groundwater)	*38*
Soil	*35*
Stormwater	*9*
Seep	*2*
Pore Water	*1*
Spring	*1*
Total Samples Collected:	***586***

PFAS Reporting Areas

1. Jordan Avenue/Northwest Base Area
2. Offbase Northern Properties
3. Offbase Coombs Road
4. Western Base Area
5. Southwest Base Area
6. Eastern Base Area
7. Former Building 653 Area
8. Industrialized Area
9. Eastern Plume/Southern Base Area

Areas 1 and 2 overlap due to the aquifer protection district in Area 1 and investigation boundary for Area 2.



2019 in Review

Basewide PFAS Investigation
Human Health Risk Evaluation

- **Conducted for chemicals detected in soil, groundwater, surface water, and sediment at concentrations greater than human health criteria**
- **Risk evaluated using worst-case (maximum detected) concentration**
- **Estimated cumulative potential cancer risk and noncancer hazard index per receptor/exposure scenario**

2019 in Review

Basewide PFAS Investigation
Human Health Risk Evaluation (continued)

Current and future human health receptors and exposure scenarios evaluated are summarized in the following table.

Receptor	Media/Exposure Scenario
Trespasser (adolescent)	Surface soil; subsurface soil (if brought to surface following future redevelopment); sediment and surface water (swimming/wading)
Commercial/Industrial Worker	Surface soil (while performing maintenance or landscaping activities, etc.); subsurface soil (if brought to surface following future redevelopment)
Resident (adult/child)	Surface and subsurface soil; groundwater (drinking water); sediment and surface water (swimming/wading)
Recreational User (adult/child)	Surface soil; subsurface soil (if brought to surface following future redevelopment); sediment and surface water (swimming/wading)
Construction Worker	Surface and subsurface soil; groundwater (excavation trench)

2019 in Review

Basewide PFAS Investigation
Human Health Risk Evaluation (continued)

- **Results did not exceed human health project screening levels in the following media/areas:**
  - **Soil:** Area 7
  - **Groundwater:** Areas 1, 2, 3, 4, and 5
  - **Surface Water:** Areas 8 and 9
  - **Sediment:** Areas 7, 8, and 9
- **These media/areas do not pose unacceptable human health risks and were not further evaluated in the risk evaluation.**

2019 in Review

Basewide PFAS Investigation
Human Health Risk Evaluation (continued)

Areas evaluated in the human health risk evaluation:

- **Soil: Area 9**
  - No unacceptable human health risks for current or future receptors
- **Groundwater: Areas 6, 7, 8, and 9**
  - Maximum PFOS and/or PFOA concentrations in these areas pose a potential noncancer hazard exceeding USEPA's target level if groundwater were to be used in the future for potable purposes.
  - No unacceptable risks for construction workers in these areas.
- **Surface Water: Areas 2 and 7**
  - No unacceptable human health risks for current or future receptors.

2019 in Review

Basewide PFAS Investigation
Next Steps

- **Develop an interim monitoring plan**
- **Anticipate moving forward under the Remedial Investigation/Feasibility Study process.**

2019 in Review

Basewide PFAS Investigation
Next Steps for PFAS Programs

- **Construction Dewatering PFAS Treatment**—Used as needed to treat PFAS in groundwater pumped from construction areas
- **Stormwater Drainage System**
  - Develop work plan to evaluate PFAS concentrations within stormwater and evaluate condition of the drainage system in impacted areas
  - Sampling anticipated to be conducted in summer 2020
- **GWETS PFAS Treatment Pilot Study**—Continue monthly sampling to monitor treatment of PFAS in groundwater associated with the Eastern Plume
- **Basewide Program**
  - Develop interim monitoring plan to continue on-base monitoring
  - Anticipate moving forward with Remedial Investigation/Feasibility Study

2019 in Review

Picnic Pond System
Feasibility Study and Proposed Plan

Final Sediment Feasibility Study (FS) – July 2019

- **Provided evaluation of eight alternatives to address impacted sediment in Pond A, Pond B, and Picnic Pond**

Proposed Plan – October 2019

- **Provides details on the eight alternatives evaluated in the FS**
- **Explains the Navy's preferred alternative to address sediment impacts**
- **Explains the remedial decision process**
  - Public comment period October 9 through November 8, 2019
  - Public informational session held on October 23, 2019, during which formal comments were received from community

2019 in Review

Picnic Pond System
Next Steps

- **Navy will formally respond to all comments**
- **Record of Decision – 2020.**

2019 in Review

Site 9 OPS Demonstration/FOST

- **Site 9, Neptune Drive Disposal Site, former incinerator and ash landfill/dump area.**
- **Operating Properly and Successfully (OPS) Demonstration Report, finalized in September 2019, documented that the required remedial actions were implemented and are operating as required .**
- **OPS involves two separate concepts:**
  - A remedial action is operating properly if it is operating as designed.
  - A remedial action is operating successfully when its operation indicates that it can achieve cleanup levels identified in the ROD and is protective of human health and the environment.
- **Successful OPS demonstration to EPA allows deeded transfer of property undergoing long-term remedial actions before cleanup levels are met.**

2019 in Review

Site 9 OPS Demonstration/FOST (continued)

- **Site 9 remedial actions per 1999 ROD:**
  - Continuation of long-term monitoring (LTM) program to verify that ash landfill contents are not impacting groundwater, to monitor progress of natural attenuation, and to monitor for contaminant plume migration (off site or to other media).
  - Land use controls (LUCs) to prevent use of and contact with impacted groundwater and prevent disturbance of or contact with contents of ash landfill/dump area at Site 9.
- **LTM program is ongoing, and adequate progress is being made toward reaching cleanup levels; no indication of contamination migration above levels of concern off site or to other media**

2019 in Review

Site 9 OPS Demonstration/FOST (continued)

- **Site 9 FOST**
  - Navy prepared Draft Finding of Suitability to Transfer, FOST 2020-1 for Parcels REC-6 and REC-11 (approximately 15.52 acres)
  - Two parcels to be transferred to Town of Brunswick
  - REC-11 contains the Site 9 LUC area north of Neptune Drive
  - REC-6 comprises land north, east, and south of Building 211; Building 211 itself and the land within its footprint were transferred to Town of Brunswick in 2016
  - Anticipate finalizing the FOST in early 2020

2019 in Review

Site 4 Explanation of Significant Differences

- **Site 4, Acid/Caustic Pit, Building 584**
  - Included in 1998 ROD for No Further Action for Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume.
  - ROD stated that no further remedial action was required but also that, because subsurface soil samples could not be collected from the presumed former acid/caustic pit location under Building 584, "If this building is ever removed, further investigations and remedial actions may be required."
  - LUCs for the site were included in the 2015 multi-site LUC ESD to prevent uncontrolled exposure to subsurface soil under the building pending further investigation.
- **Additional investigations conducted in 2011 and 2016 included surface geophysical surveying and soil and groundwater sampling to determine location of former pit and evaluate any associated contamination.**

2019 in Review

Site 4 ESD (continued)

- **Based on results of additional investigations, site is safe for unrestricted use and LUCs are no longer required.**
- **LUCs for groundwater underlying Site 4, which is within the combined Sites 1, 2, and 3 and Eastern Plume groundwater management zone, remain in place as part of the remedies for those sites and were changed by the ESD.**
- **The Base-Wide Land Use Control Implementation Plan will be updated based on the ESD to remove the requirement for Site 4 LUCs.**

2019 in Review

Quarry and Site 2 RACRs

- **Remedial Action Completion Reports (RACRs) document that required remedial actions have been implemented and that remedial action objectives (RAOs) have been met**
- **Associated step in CERCLA process is Remedial Action-Operation (RA-O), which is when:**
  - Construction activities have been completed.
  - RAOs have been met (but cleanup goals have not yet been met).
  - Activities such as treatment system operations and maintenance, long-term monitoring, and LUC maintenance and monitoring are ongoing.
- **For Quarry Area:**
  - Installation of soil cover over Waste Disposal/Fall Area completed
  - LUC objectives met based on continued Navy control
  - Groundwater monitoring (for migration evaluation) and LUC maintenance.

2019 in Review

Quarry and Site 2 RACRs (continued)

- At Site 2, soil cover construction is complete, LUC objectives have been met, and LTM will continue until cleanup levels are achieved.
- Site 2 RACR is on hold pending finalization of construction completion report; period of performance needed to be extended for construction contractor to finalize report.

Upcoming Work - 2020

Airfield Stormwater Drain System Study

Objective: Develop remedial measures if/as necessary to address PFAS in groundwater infiltrating into the Stormwater Drainage System, which discharges to Picnic Pond/Mere Brook

Study Areas:

- Central Base Area
  - Airfield Area - flightline runways, taxiway, and apron areas
    - Discharges to Picnic Pond System
- Mere Brook Line
  - Originates west of runway, crosses under runway in culverts
  - Captures stormwater between runways and taxiway and along western side of runway area
  - Discharges in southeastern portion of former base

Upcoming Work - 2020

Airfield Stormwater Drain System Study Scope:

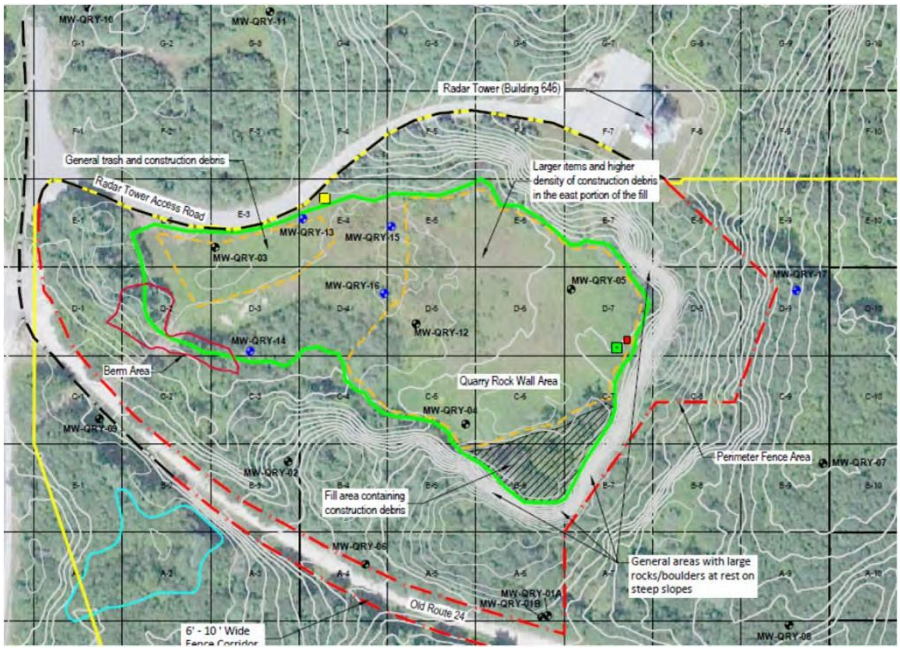
- **Develop work plan (underway)**
- **Conduct two rounds of stormwater PFAS sampling (spring/early fall)**
- **Install/sample shallow groundwater wells to define plume geometry and identify groundwater levels near drain lines**
- **Remove debris and sediment from stormwater drains and conduct stormwater lines video survey**
- **Prepare a report with recommendations for reduction of PFAS-contaminated groundwater infiltration to the Airfield Stormwater Drainage System**
- **Develop design for remediation of the Airfield Stormwater Drainage System to reduce PFAS-contaminated groundwater infiltration (if/as needed)**

Upcoming Work - 2020

Quarry Groundwater Monitoring

- **Six new monitoring wells were installed at five locations during cap installation activities in December 2018**
  - Shallow groundwater was targeted as the wells are mostly located within the waste disposal area
  - Four wells were completed in bedrock, two in overburden
- **A groundwater sampling plan will be developed for collection/analysis of samples from new and existing wells**
  - Groundwater sampling will be performed during the spring 2020 round of LTM sampling

Quarry Well Locations



Upcoming Work - 2020

Five-Year Review

- **Preparation of Fifth Five-Year Review Report will begin in early 2020.**
- **Per EPA guidance, review includes all CERCLA sites with signed RODs to ensure that implemented remedies remain protective of human health and the environment.**
- **Does not include sites without signed RODs or contaminants not identified as chemicals of concern in RODs (for which remedies have not yet been determined).**
- **Will include document review, site walkovers, and additional evaluation as needed to evalute protectiveness.**
- **Cutoff date for remedial actions to be included the evaluation is January 2020.**

Upcoming Work - 2020

Additional Extraction Well Evaluation – Eastern Plume

- Current Eastern Plume extraction system consists of six extraction wells operating at ~60 gpm combined flow rate
- The Navy is planning to perform a review of extraction system performance
- Funding is being set aside for one to two new extraction wells pending discussions/consensus between the Navy, EPA, and MEDEP that an additional well or wells is warranted
- The overall pumping rate is constrained by the infiltration gallery capacity, thus rebalancing of flows may be necessary if wells are added

Upcoming Work - 2020

Recurring Activities

Semi-annual and annual LTM events

- Sites 1/3 Landfill, Site 2, Site 7, Site 9, Site 17, Eastern Plume
- A round of groundwater sampling at the Quarry will be added for 2020

GWETS PFAS Evaluation

- Monthly sampling to continue
- Additional carbon changeouts will be performed if/as needed

Upcoming Work – 2020

Recurring Activities (continued)

CERCLA LUC Inspections

- **Annual inspections of CERCLA sites are conducted in the fall of each year to confirm continued compliance with LUC objectives documented in RODs.**
- **Inspections include the following sites:**
  - Sites, 1, 2, 3, and Eastern Plume – soil and groundwater LUCs
  - Site 7 – soil and groundwater LUCs
  - Site 9 – soil and groundwater LUCs
  - Site 12 – soil LUCs
  - Quarry Area – soil LUCs
- **Site 4 LUCs no longer required per 2019 ESD**
- **Basewide LUCIP will be updated to include Site 12 and Quarry Area and remove Site 4**

Questions

Questions?

Future RAB Agenda Topics?

See you at the next RAB Meeting!

Thank You!

List of Acronyms

CDWTS	Construction Dewatering Water Treatment System
BACSE	Brunswick Area Citizens for a Safe Environment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability act
EMNR	Enhanced Monitored Natural Attenuation
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FOST	Finding of Suitability to Transfer
FS	Feasibility Study
GAC	Granular activated carbon
gpm	Gallons per minute
GWETS	Groundwater extraction and treatment system
HA	Health Advisory
LTM	Long-term monitoring
LUC	Land use control
LUCIP	Land Use Control Implementation Plan
MEDEP	Maine Department of Environmental Protection

List of Acronyms

MNR	**Monitored Natural Attenuation**
MRRA	**Midcoast Regional Redevelopment Authority**
NAS	**Naval Air Station**
ng/L	**Nanogram per liter**
O&M	**Operations and maintenance**
OPS	**Operating Properly and Successfully**
PFAS	**Poly- and perfluoroalkyl substances**
PFBS	**Perfluorobutane sulfonic acid**
PFOA	**Perfluorooctanoic acid**
PFOS	**Perfluorooctanesulfonic acid**
RAB	**Restoration Advisory Board**
RACR	**Remedial Action Completion Report**
RAG	**Remedial Action Guideline Remedial**
RA-O	**Action-Operation**
ROD	**Record of Decision**
UXO	**Unexploded ordnance**
VOC	**Volatile organic compound**